PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BOARD OF PATENT APPEALS AND INTERFERENCES

APPLICANTS:	Raimund RATZI ET AL - 2 PCT		
SERIAL NO.:	10/529,294	EXAMINER:	W. ZHU
FILED:	MARCH 25, 2005	GROUP:	1742
TITLE:	METHOD FOR PRODUCING A MOLDED BODY FROM SINTERED STEEL		

REPLY BRIEF

MAIL STOP APPEAL BRIEF
Assistant Commissioner for Patents
P.O. Box 1450
Alexandria, VA 2313-1450

Dear Sir:

Appellants herewith submit a Reply Brief pursuant to 37 C.F.R. 41.41 in response to the Examiner's Answer dated March 28, 2008.

The Examiner has rejected claims 1-3 under 35 U.S.C. § 103(a) as being unpatentable over *Marshall et al.* (GB 975322) in view of *Nishida et al.* (Effect of B on the Densification and the Mechanical Properties of Sintered Iron Powder Compacts, J. Japan Inst. Metals, Vol. 54, No. 10 (1990), pp. 1147-1153).

This rejection is respectfully traversed as it is believed to be in error for the following reasons.

I. Examiner's Answer at page 5, under section X, full page.

Marshall et al. explains (page 1, lines 20 to 29) that it is advantageous not to use pre-alloyed powders. In lines 40 to 42, it states that nickel can be used as a pre-alloyed powder with one or two of the other (alloy) metals indicated, and this also corresponds to claim 3 of Marshall as cited by the Examiner. The Examiner asserts *Marshall et al.* discloses that boron can be pre-alloyed with nickel. Boron is a known non-metal in the periodic table. Therefore, it is respectfully submitted that a pre-alloyed powder that contains nickel and boron is not disclosed by *Marshall et al.* This circumstance is also evident from the explanations by Marshall et al. with regard to the boron content, when it is explained on page 1, lines 55 and 56, that boron can be added not only in amorphous form, but also as ferroboron or as metallic borate. Because *Marshall et al.* excludes the pre-alloy of iron, nickel and boron, the combination of *Marshall et al.* and *Nishida et al.* would not render the present invention obvious to one of ordinary skill in the art.

II. Examiner's Answer at page 6 to page 8, first paragraph.

Second, the Examiner states the *Nishida et al.* does not limit the proportion of the master alloy powder to be at least 3 wt.%. However, *Nishida et al.* discloses that a liquid phase proportion of at least 9 vol.% has to be achieved for adequate density of the sintered steel and special benefits to tensile strength (page 12, last paragraph and

FIG. 6). As a result, this requires that the proportion of pre-alloy powder is greater than 3 wt.%, which also requires that the boron content in the total mixture is greater than 0.3%. Anything less than 0.3% in *Nishida et al.* would result in an inadequate density of the sintered steel and tensile strength.

A proposed combination of prior art that renders the prior art unsatisfactory for its intended purpose does not suggest or motivate the proposed combination, and such combination of the prior would not render the claims *prima facie* obvious. See MPEP 2143.01 V. Claim 1 of the present invention requires that the boron content of the powder mixture is between 0.03% and 0.2% by weight. Because the boron content in the total mixture of *Nishida et al.* must be greater than 0.3% to achieve its intended purposes of adequate density of the sintered steel and tensile strength, and the present invention requires a boron content of at most 0.2%, any teaching in *Marshall et al.* of a boron content less than 0.3% would render the invention in *Nishida et al.* unsatisfactory for its intended purpose. Therefore, *Nishida et al.* and *Marshall et al.*, when combined, do not render the present invention obvious.

Even if Appellant's method were obvious, Appellant's method of making sintered steel to produce steel with good tensile strength while using a lower boron content to create strong impact strength creates surprising or unexpected results, which is usually sufficient to overcome a case of *prima facie* obviousness. In reading *Nishida et al.* one of ordinary skill in the art would expect that in order to produce a sintered steel with a

adequate tensile strength, a master alloy powder of Ni, B, and Fe with B at 10 wt.% in a powder mixture with the master alloy powder at 3 - 7% weight amount or greater would have to be used, because otherwise there would not be sufficient liquid phase in the eutectic (9%) to produce the desired density. Likewise, in reading *Nishida et al.* one of ordinary skill in the art would consider that sintered steel produced with a similar master alloy powder, but with a very low boron content, would have poor tensile strength because of insufficient liquid phase produced in the eutectic. Therefore, the surprising or unexpected results that (1) the tensile strength can be increased by reducing the boron content despite the use of pre-alloyed powder of iron, nickel and boron and (2) the impact resistance can be significantly improved is neither taught nor suggested by either *Nishidia et al.* or *Marshall et al.*

Accordingly, Appellants respectfully submit that the appealed claims 1-3 are patentable over *Marshall et al.* in view of *Nishida et al.*

III. Evidence and Related Proceedings Appendices

Evidence and Related Proceedings Appendices are attached indicating "None."

IV. Conclusion

For the reasons presented in the Appeal Brief and the reasons presented above, Appellants believe that the appealed claims are allowable over the cited prior art references, and respectfully request that the Board of Patent Appeals and Interferences

reconsider the rejection of the appealed claims and reverse the decision of the Examiner in whole.

Respectfully submitted,
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Enclosure: Evidence Appendix, Related Proceedings Appendix

CERTIFICATION OF ELECTRONIC FILING

I hereby certify that this correspondence is being electronically filed in the U.S.. Patent and Trademark Office on May 28, 2008.

/Davide Garofalo/
Davide Garofalo

APPENDIX A

EVIDENCE PRESENTED

Applicant is not submitting any additional evidence with this Reply Brief.

APPENDIX B

RELATED APPEALS AND PROCEEDINGS:

None.